

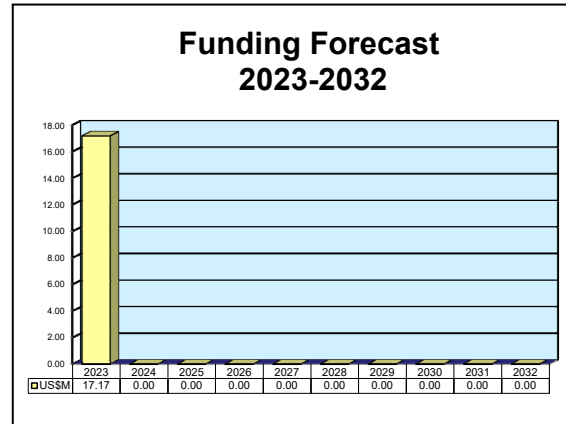
ARCHIVED REPORT

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EMARSS

Outlook

- Only the EMARSS-S variant is an original platform; all other variants are reconfigured existing special mission aircraft
- U.S. Army plans to divest all EMARSS platforms in FY25
- Congress could reinstate EMARSS funding
- If Congress does not reinstate funding, this report will be archived in 2024



Orientation

Description. The Enhanced Medium Altitude Reconnaissance Surveillance System is a U.S. Army program for an airborne manned, multisensor, intelligence collection platform. The EMARSS flies on board the C-12 (King Air 350) platform in various configurations.

Sponsor
 U.S. Army
 Intelligence and Security Command (INSCOM)
 47123 Buse Rd, IPT, Unit 7
 Patuxent River, MD 20670-5440
 USA
 Website: <http://www.navair.navy.mil>

Status. Modifications completed. The EMARSS has been defunded and re-funded repeatedly in recent times.

Application. The objective of the EMARSS program was to improve the capabilities of the Army's Guardrail and Airborne Reconnaissance Low (ARL) intelligence platforms. It was designed to fulfill Army requirements for manned intelligence, surveillance, reconnaissance, and targeting (ISR&T) capability.

EMARSS aircraft are based on the King Air 350.

Price Range. U.S. Army FY14 budget documents list the EMARSS-S LRIP system's cost at \$28.68 million. With the procurement cost of \$3.30 million figured into the sum, the total unit cost is \$31.98 million for a fully configured platform.

The average price inclusive of all EMARSS variants, including both procurement and modification costs, is approximately \$19.15 million.

Contractors

Prime

Adams Communication & Engineering Technology Inc (ACET), Headquarters	http://www.adamscomm.com , 11637 Terrace Dr, #201, Waldorf, MD 20602 United States, Tel: + 1 (301) 861-5000, Prime
Boeing Defense, Space & Security, Military Aircraft, Mobility Division	http://www.boeing.com/defense , Route 291 and Stewart Ave, Ridley Park, PA 19078 United States, Tel: + 1 (610) 591-1919, Prime

EMARSS

L3Harris - ISR Systems	http://www.l3harris.com/all-capabilities/scalable-open-architecture-reconnaissance , 10001 Jack Finney Blvd, Greenville, TX 75402 United States, Tel: + 1 (903) 455-3450, Fax: + 1 (903) 457-4413, Prime
Northrop Grumman Technology Services	http://www.northropgrumman.com , 2340 Dulles Corner Blvd, Herndon, VA 20171 United States, Tel: + 1 (703) 713-4000, Prime
Sierra Nevada Corp	http://www.sncorp.com , 444 Salomon Circle, Sparks, NV 89434 United States, Tel: + 1 (775) 331-0222, Fax: + 1 (775) 331-0370, Email: productinfo@sncorp.com , Prime
AASKI Technology	http://aaski.com , 1 Radar Way, Tinton Falls, NJ 07724 United States, Tel: + 1 (732) 493-1700, Fax: + 1 (732) 492-1701, Program Participant (EMARSS Operations, Maintenance, and Sustainment)
BAE Systems Inc, Electronic Systems (HQ)	http://www.baesystems.com , 65 Spit Brook Rd, Nashua, NH 03060 United States, Tel: + 1 (603) 885-4321, Fax: + 1 (603) 885-2772, Program Participant (AWAPSS Sensor)
CACI Inc	http://www.caci.com , 1100 N Glebe Rd, Arlington, VA 22201 United States, Tel: + 1 (703) 841-7800, Fax: + 1 (703) 841-7882, Program Participant (SIGINT Sensor)
Canadian Commercial Corp	http://www.ccc.ca , 350 Albert St, Ste 700, Ottawa, Ontario, Canada, Tel: + 1 (613) 996-0034, Fax: + 1 (613) 995-2121, Program Participant (MX-15 Sensor Support)
Johns Hopkins University, Applied Physics Laboratory	http://www.jhuapl.edu , 1110 Johns Hopkins Rd, Laurel, MD 20723 United States, Tel: + 1 (240) 228-5000, Program Participant (LIDAR Integration)
Leidos	http://www.leidos.com , 1750 Presidents St, Reston, VA 20879 United States, Tel: + 1 (571) 526-6000, Program Participant (Support & Operations)

Subcontractor

BAE Systems Inc, Electronic Systems	http://www.baesystems.com , 6500 Tracor Ln, Austin, TX 78725-2070 United States, Tel: + 1 (512) 926-2800, Fax: + 1 (512) 929-2381, Email: idsmarketing@baesystems.com (ALE-47)
Booz Allen Hamilton	http://www.boozallen.com , 8283 Greensboro Dr, McLean, VA 22102 United States, Tel: + 1 (703) 902-5000
Fibertek Inc	http://fibertek.com , 13605 Dulles Technology Dr, Herndon, VA 20171 United States, Tel: + 1 (703) 471-7671, Fax: + 1 (703) 471-5806, Email: info@fibertek.com (EMARSS-G Sensor Server)
L3Harris	http://www.l3harris.com , 600 Third Ave, New York, NY 10016 United States, Tel: + 1 (212) 697-1111, Fax: + 1 (212) 490-0731 (Ku-Band COTM Antenna System)
L3Harris - Wescam	http://www.l3harris.com , 649 N Service Rd W, West Burlington, Ontario, Canada, Tel: + 1 (905) 633-4000, Fax: + 1 (905) 633-4100 (MX-15Di)
Northrop Grumman Mission Systems	http://www.northropgrumman.com , 1580 W Nursery Rd A, Linthicum, MD 21090 United States, Tel: + 1 (410) 765-1000, Email: es_communications@ngc.com (ZPY-5 VaDER)

Contractors are invited to submit updated information to Editor, International Contractors, Forecast International, 75 Glen Road, Suite 302, Sandy Hook, CT 06482, USA; rich.pettibone@forecast1.com

Technical Data

Design Features. The EMARSS-S fulfills Army requirements for a manned airborne intelligence, surveillance, and reconnaissance (AISR) system that provides a persistent capability to detect, locate, classify/identify, and track surface targets both day and night and in nearly all weather conditions with a high degree of timeliness and accuracy. The EMARSS-S

consists of a commercial derivative aircraft equipped with an electro-optic/infrared full-motion video sensor, a communications intelligence (COMINT) collection system, an aerial precision guidance system, line-of-site tactical and beyond line-of-site (LOS/BLOS) communications suites, two operator workstations, and a self-protection suite.

EMARSS

EMARSS-S provides a response to combat forces' ISR tasking through centralized processing, exploitation, and dissemination of ISR information while simultaneously transmitting critical full-motion video and intelligence products to engaged tactical forces.

The U.S. Army has not made public its specifications for EMARSS-S range or altitude. However, mission altitude and flight tracks are chosen to optimize sensor data collection on the target area of interest while avoiding known threats. Flight tracks may be selected

to strike a balance among the capabilities of multiple sensors, or to optimize collection from individual sensors based upon the daily collection tasking dictated by the tactical commander's priority intelligence requirements.

Note: *The information in **Technical Data**, above, specifically refers to the EMARSS-S variant. Information on other variants can be found in the **Variants/Upgrades** section.*



King Air 350-Based EMARSS-S in Flight

Source: U.S. Army

Variants/Upgrades

ASQ-240. ASQ-240 is the A/N designation for EMARSS aircraft. Since there are several EMARSS variants, there are also several ASQ-240 variants. The ASQ-240 variants are believed to correspond to the EMARSS names in the following manner: ASQ-240(V)1 is the EMARSS-S, ASQ-240(V)2 is the EMARSS-M, ASQ-240(V)3 is the EMARSS-V, and ASQ-240(V)4 is the EMARSS-G.

EMARSS-E. The EMARSS-E variant was an emerging program for development of an ELINT-optimized EMARSS aircraft. A June 2019 U.S. Army industry briefing document listed the following as among the EMARSS-E equipment requirements: AAR-57 CMWS, CENTRIX-K, CHALS-SD (COMINT), DPU v3 Banshee (COMINT), DRT (COMINT), KG-175 cryptography, Link 16 TCDL, Mustang APG (COMINT), NSANet, PRC-117 radio, Pro Line 21, RELROK, RFCM (or jammer), SIPRNet, SS-4000 (ELINT), and VSM BLoS. In August 2019, L3 Communications was awarded a contract to provide the EMARSS-E's common datalink (CDL) and satcom equipment.

EMARSS-G. The EMARSS-G variant is based on the Constant Hawk mission set in its CH-A (Constant Hawk - Afghanistan) configuration, as used on board King Air 200s. It is equipped for TACOP (tactical operations) light detection and ranging (LIDAR) missions. The Constant Hawk reportedly carries a 96-megapixel camera. L3 Technologies is the prime contractor for the EMARSS-G variant.

EMARSS-M. The EMARSS-M variant is based on the U.S. Air Force's MC-12W Project Liberty aircraft. L3 Technologies is the prime contractor for this variant.

EMARSS-S. The EMARSS-S variant was designed for the original EMARSS program, before the range was widened to include the other variants. Boeing is the prime contractor for the EMARSS-S variant.

EMARSS-V. EMARSS-V aircraft are equipped with the VaDER (Vehicle and Dismount Exploitation Radar), which is optimized for ground moving target indicator (GMTI) and synthetic aperture radar (SAR) imaging operation. Sierra Nevada Corporation is the prime contractor for the EMARSS-V.

EMARSS

Program Review

Background. The objective of the U.S. Army's Aerial Common Sensor (ACS) program was to merge and improve the capabilities of the Army Guardrail and ARL intelligence platforms into a single integrated ISR system. Prime contractor Lockheed Martin was awarded an \$821.55 million contract for development and production of five ACS aircraft in 2004.

In June 2005, ACS program management concluded that the specified Embraer ERJ 145 jet could not handle the weight of the payload, cabling, cooling systems, and power units required for the plane. The Army terminated the Lockheed Martin ACS contract in January 2006. However, the Army stated that the ACS program itself had not been terminated.

Army Releases Pre-solicitation

U.S. Army FY10 budget documentation (published May 2009) states that the Medium Altitude Reconnaissance and Surveillance System (MARSS) program would provide six additional EMARSS units based on a Hawker Beechcraft King Air 350 Extended Range (ER) aircraft. MARSS aircraft are primarily based on the King Air 300 platform equipped with numerous sensors, including imagery and COMINT payloads, several LOS/BLOS communications systems, and onboard processing of the imagery and COMINT.

In December 2009, the Army released a pre-solicitation notice for EMARSS. According to the notice, EMARSS was developed as a program based on an Army G-3/5/7 directed requirement signed in December 2009. The requirement was to field this capability within 18 months of contract award.

At the time of the pre-solicitation notice, the appropriate Joint Capabilities Integration and Development System requirements documents were in development. Army management was planning to convene a Material Development Decision review in the second quarter of FY10. The decision to pursue EMARSS was a direct result of reviewing the Army's approach to AISR and applying lessons learned from overseas operations.

The period of performance for the engineering and manufacturing development (EMD) contract was anticipated to be 42 months. The first four EMARSS units were scheduled to be delivered within 18 months of contract award, and the remaining 24 months was allocated for additional testing. An option for low-rate initial production (LRIP) was anticipated to be part of the effort.

In U.S. Army FY11 budget documentation (published February 2010), the Department of Defense redefined

the ACS program as the Enhanced Medium Altitude Reconnaissance and Surveillance System. According to that document, the EMARSS Milestone C decision was scheduled for the fourth quarter of FY11 and full-rate production for the third quarter of FY12.

Multiple EMARSS Bidders

In June 2010, both Boeing and Northrop Grumman announced they would compete to be the EMARSS prime contractor. L-3 Communications (now a part of L3Harris) and the team of Lockheed Martin/Sierra Nevada also submitted bids.

All bidders brought either significant experience or relevant technology to the program. For example, Sierra Nevada was the prime contractor for the MARSS effort, the predecessor to EMARSS. Northrop Grumman was the prime contractor for the U.S. Army Guardrail program; the Guardrail is an aircraft that the EMARSS is replacing. Additionally, L3 Technologies configured King Air 350ER aircraft (MC-12W) with ISR capabilities for the U.S. Air Force as part of the Project Liberty program, and in August 2010, Boeing acquired Argon ST, a developer of C4ISR and combat systems that are more than likely included in its EMARSS bid.

At the time of bidding, the *Journal of Electronic Defense* reported that the Army had specified the twin-engine King Air 350ER turboprop built by Hawker Beechcraft (now Beechcraft) as the EMARSS platform.

Contract Award and Protest

In November 2010, the U.S. Army Communications-Electronics Command (CECOM) awarded Boeing an \$88 million EMARSS contract that encompassed a 24-month base effort for four EMD units, with an option for an additional two EMD units. The contract included options for a total of six LRIP units and interim contractor logistics support. The total performance period of the contract, if all options were exercised, was 42 months.

Within a month, L-3 Communications, Northrop Grumman, and the team of Lockheed Martin/Sierra Nevada filed a protest with the U.S. Government Accountability Office (GAO) over the Boeing EMARSS win. Due to the protest, the Army issued a stop-work order to Boeing.

Meanwhile, Boeing continued to do a limited amount of EMARSS work, such as planning and fulfillment of long-lead orders.

EMARSS***Cancellation***

The U.S. Army's FY13 budget requests included no further funding for EMARSS beyond enough to complete the EMD phase to Milestone C. Withdrawal of government funding came as no surprise, as earlier (in October 2011) the Army had said that it was canceling the program.

Several issues factored into EMARSS' potential cancellation. First, the U.S. military framed it as a reduction of a costly redundancy between the Air Force and the Army. The U.S. Air Force already operated a fleet of MC-12W Project Liberty aircraft very similar in specification to the EMARSS aircraft – both were also based on the Beechcraft King Air 350ER platform.

Second, the EMARSS effort fell into disfavor when it suffered the delays caused by protests from the contract's losing bidders. The production schedule was pushed back as the award's challengers were dealt with and costs increased.

Wind-down and the Future of EMARSS

With the threat of cancellation an ongoing issue, the ultimate fate of the LRIP aircraft had fallen into routine debate.

One plan had the Air Force's MC-12W Project Liberty aircraft being transferred to the Army and the LRIP EMARSS being folded into the fleet. This option saw its detractors, however, and a legislative measure to approve this move was voted down by the U.S. Congress in late 2011.

Another option would have the U.S. Air Force taking possession of the Army's EMARSS units and folding them into the Project Liberty fleet. In October 2011, Army Lt. Gen. Robert Lennox voiced that the Army would be supportive of such a scenario.

Despite the uncertainty, Boeing continued production of the four LRIP EMARSS units. U.S. Army FY13 budget documents planned for the EMARSS' Milestone C event to be achieved in the second quarter of FY13 and initial operational test and evaluation to occur in the first quarter of FY14.

Meanwhile, as part of the EMARSS effort, a Distributed Common Ground System (DCGS) integration lab was created by the Intelligence and Information Warfare Directorate within the Research, Development and Engineering Command. The lab integrated the DCGS with the EMARSS platform, but also refocused the effort so that the Project Liberty aircraft could be made compliant with the system.

2013/2014 Developments

The future standing of the EMARSS program continued to be debated throughout 2013. After flirtation with defunding, funding was sustained in FY14 budget requests. The new prioritization would allow Milestone C to be achieved, albeit at a later date than originally planned.

In 2013, the U.S. Army displayed a resurrected interest in the EMARSS program. Federal Business Opportunities (FBO) released the names of several EMARSS-related sources that had sought requests. Additionally, the Army awarded Boeing an undisclosed sum to provide two additional EMARSS EMD aircraft, bringing the EMD unit total to six.

In June 2013, the first EMARSS EMD aircraft arrived at Aberdeen Proving Ground to begin evaluation. Around August it was followed by a second aircraft. Two more EMARSS EMD units were expected to arrive by the end of 2013, completing delivery of the four initial orders.

Meanwhile, the U.S. had begun to gather market information on the potential acquisition of another 12 EMARSS aircraft. A March 2013 FBO information request outlined the potential acquisition.

However, by early 2014 the conversation had shifted to a scenario in which MC-12 aircraft would be transferred from the Air Force to the Army. The MC-12s would then be converted to the EMARSS configuration. In April 2014, Cmdr. Amy Derrick-Frost said the MC-12 transfer, if approved by lawmakers, would occur no later than the first quarter of FY15.

In the Army's FY15 budget request, the EMARSS' Milestone C decision was pushed back to the fourth quarter of 2014.

EMARSS**Funding**

FUNDING, U.S. Army								
	<u>Prior</u>	<u>Prior</u>	<u>FY22</u>	<u>FY22</u>	<u>FY23</u>	<u>FY23</u>	<u>FY24</u>	<u>FY24</u>
	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>
Procurement								
<i>LI#1036AZ2001 –</i>								
<i>Multi Sensor ABN Recon (MIP)</i>								
<i>Item# AZ2054 –</i>								
<i>EMARSS Payloads</i>	-	91.403	-	9.912	-	0.456	-	0.000
<i>Item# AZ2056 - ABN ISR Mods (MIP)</i>	-	54.435	-	17.210	-	17.210	-	0.000
<i>LI#3405A02112 –</i>								
<i>EMARSS SEMA Mods (MIP)</i>								
	-	267.974	-	1.568	-	1.591	-	0.000
	<u>FY25</u>	<u>FY25</u>	<u>FY26</u>	<u>FY26</u>	<u>FY27</u>	<u>FY27</u>	<u>FY28</u>	<u>FY28</u>
	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>	<u>QTY</u>	<u>AMT</u>
<i>LI#AZ2001 –</i>								
<i>Multi Sensor ABN Recon (MIP)</i>								
<i>Item# AZ2054 –</i>								
<i>EMARSS Payloads (MIP)</i>	-	0.000	-	0.000	-	0.000	-	0.000
<i>Item# AZ2056 - ABN ISR Mods (MIP)</i>	-	0.000	-	0.000	-	0.000	-	0.000
<i>LI#3405A02112 –</i>								
<i>EMARSS SEMA Mods (MIP)</i>								
	-	0.000	-	0.000	-	0.000	-	0.000
	<u>Prior</u>	<u>FY22</u>	<u>FY23</u>	<u>FY24</u>	<u>FY25</u>	<u>FY26</u>	<u>FY27</u>	<u>FY28</u>
	<u>AMT</u>	<u>AMT</u>	<u>AMT</u>	<u>AMT</u>	<u>AMT</u>	<u>AMT</u>	<u>AMT</u>	<u>AMT</u>
RDT&E								
<i>PE#0305206A –</i>								
<i>Airborne Reconnaissance Systems</i>								
<i>EH2: EMARSS Adv Dev (MIP)</i>	N/A	1.834	2.096	0.000	0.000	0.000	0.000	0.000
<i>EH3: EMARSS Payloads Adv Dev (MIP)</i>	N/A	5.916	15.069	0.000	0.000	0.000	0.000	0.000

Note: PE#0305206A was transferred from PE#060526A for FY16 and beyond

EMARSS received no funding requests from FY24 forward due to planned divestiture in FY25

All \$ are in millions.

N/A = Not Available

Sources: U.S. Department of the Army, FY24 Budget Estimate, Aircraft Procurement, Army, Budget Activity 2, March 2023;
U.S. Department of the Army, FY24 Budget Estimate, RDT&E, Army, Volume III, Budget Activity 7, March 2023

Contracts/Orders & Options

<u>Contractor</u>	<u>Award</u> <u>(\$ millions)</u>	<u>Date/Description</u>
Boeing	88.101	Nov 2010 – FFP contract for EMARSS. The contract encompassed a 24-month base effort for four EMD units, with an option for an additional two EMD units. The contract included options for a total of six LRIP units and interim contractor logistics support. The total performance period of the contract, if all options were exercised, was 42 months. Contract had an estimated completion date of Nov 29, 2012. Bids were solicited on the Web, with six received. CECOM Contracting Center, Aberdeen Proving Ground, MD, was the contracting activity. (W15P7T-11-C-S801)

EMARSS

<u>Contractor</u>	<u>Award (\$ millions)</u>	<u>Date/Description</u>
Boeing	?	Jun 2013 – Contract modification for two additional years to procure two more EMARSS EMD aircraft, up to three EMARSS maintenance vehicles, and interim contractor logistics support services. The contract value was redacted in published materials. (W15P7T-11-C-S801-P00026)
L-3 Comm., Mission Integration Division	31.831	Mar 2015 – FPI contract to modify one U.S. government-owned QRC (quick reaction capability) Liberty Project aircraft to the EMARSS-M configuration. The estimated completion date was Sep 30, 2016. (W58RGZ-15-C-0038)
L-3 Communications	129.661	Nov 2015 – FFP contract to modify 13 QRC aircraft to comply with EMARSS. The estimated completion date was Nov 23, 2019. (W58RGZ-16-C-0013)
AASKI Technology	12.237	Dec 2019 – CPFF delivery order (P00015) to provide incremental funding in support of EMARSS and MARSS operations and sustainment. (W56KGY-19-F-0025)
AASKI Technology	14.230	Jan 2020 – CPFF delivery order (P00017) to provide incremental funding in support of MARSS, EMARSS, and Guardrail EMARSS operations and sustainment. (W56KGY-19-F-0025)
Northrop Grumman	21.703	Jun 2020 – Modification (P00063) to a previously awarded contract to provide logistics support services for the government-owned fixed-wing fleet performing SEMA missions. Work was expected to be completed Aug 31, 2021. (W58RGZ-17-C-0014)
Northrop Grumman	20.715	Jul 2020 – Modification (P00077) to a previously awarded contract for contractor logistics support services for the government-owned, fixed-wing fleet performing SEMA missions. Work was expected to be completed Aug 31, 2021. (W58RGZ-17-C-0014)
Northrop Grumman	18.137	Aug 2020 – Modification (P00088) to a previously awarded contract for contractor logistics support services for the government-owned, fixed-wing fleet performing SEMA missions. Work was expected to be completed Aug 31, 2020. (W58RGZ-17-C-0014)

Worldwide Distribution/Inventories

The Enhanced Medium Altitude Reconnaissance Surveillance System (EMARSS) is a U.S. Army program.

Forecast Rationale

After years of on and off support from the U.S. government, the FY24 U.S. Army budget requests revealed that the EMARSS program would conclude just after the final units finished coming on line. All EMARSS aircraft are planned to be divested in FY25.

Over its lifetime, the EMARSS program changed significantly. In its ultimate form, the EMARSS program moved away from procurement of originally configured, new-build aircraft (this configuration is now

known as the EMARSS-S) to procurement of retooled versions of existing aircraft.

Specifically, the EMARSS program was refocused to prioritize the reconfiguration of existing special mission C-12 platforms to fit the EMARSS mission, creating derivatives known as the EMARSS-G, EMARSS-M, and EMARSS-V. The retooled EMARSS variants were procured in addition to a limited number in the EMARSS-S configuration.

EMARSS

More recent discussions included the incorporation of an additional ELINT-focused variant, dubbed the EMARSS-E. An initial contract in support of the new variant was awarded in August 2019, but with the demise of the overall EMARSS program, these aircraft are not thought to have ever flown.

Although the Army's current plan is to divest its EMARSS inventory, there is still a chance that Congress could reinstate funding.

The current forecast assumes that Congress does not save the EMARSS program, an eventuality that is highly likely given the difficulty Congress had raising

the U.S. debt ceiling. With cost cuts on the way, there will likely be minimal support for sustaining a program that the Army no longer wants.

If Congress does not reinstate any EMARSS funding, this report will be archived in 2023.

Note: *No international customers are expected for any of the EMARSS variants. Although foreign militaries may procure King Air-based aircraft with similar mission sets, due to design elements developed especially for the U.S. Army, overall mission equipment will likely vary substantively.*

Ten-Year Outlook

ESTIMATED CALENDAR YEAR RDT&E FUNDING (in millions US\$)												
Designation or Program	High Confidence					Good Confidence			Speculative			Total
	Thru 2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	
MFR Varies												
EMARSS - Enhanced Medium Altitude Reconnaissance Surveillance System <> United States <> Army <> King Air C-12												
	645.97	17.17	.00	.00	.00	.00	.00	.00	.00	.00	.00	17.17
Total	645.97	17.17	.00	.00	.00	.00	.00	.00	.00	.00	.00	17.17